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EXAMINER	
CHAWAN, SHEELA C	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/586,046	KIMMEL, RON
	Examiner	Art Unit
	SHEELA C. CHAWAN	2624

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 July 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/8/08; 7/14/06*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Preliminary Amendment

1. Preliminary amendment filed on 7/14/06 has been entered.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on 8/8/08; 7/14/06, the information disclosure statement is being considered by the examiner.

Drawings

3. The Examiner has approved drawings filed on 7/14/06.

Claim Objections

Claims 1, 11 and 15 are objected to because of the following informalities:

Claim 1 is objected to because of the following informalities:

In claim 1, line 7, change "," to --; -- .

Similarly claims 11 and 15 need to be corrected.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 14 – 17, are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. The Federal Circuit[1], relying upon Supreme Court

[1] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

precedent[2], has indicated that a statutory "process" under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the "machine or transformation test", whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590"). While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform an article nor positively tie to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. The 101 issues can be solved by adding a particular machine (i.e. a processor or a computer to any of steps of the claim would over come 101.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1- 17, are rejected under 35 U.S.C. 102(b) as being anticipated by Huang et al., (US. 6,438,272 B1, Listed in IDS filed on 8/8/08).

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[2] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

As to claim 1, Huang discloses a 3D scanning device (note, surface containing device, consisting of a DMD (column 7, lines 54- 58) is explained and its function (column 7, lines 61- 64, also see fig 1 (element 18 and 20); comprising:

a digital light encoding unit comprising a digital micro mirror device for encoding a succession of structural light signals onto a light beam directed to an object, a structure of said signal being selected such that distortions thereof by a contoured object reveal three-dimensional information of said contour(note, surface containing device, consisting of a DMD (column 7, lines 54- 58) is explained and its function(column 7, lines 61- 64, also see fig 1 (element 18 and 20, also note, column 5, lines 4-9, the countering (detector) and projection are synchronized along with color converting of the object (see also fig 1) where the synchronized link (column 14, lines 6-4, column 13, lines 65- 67; column 14, lines 1-8);

a detector synchronized with said digital light processing unit for detecting reflections of said light beam from said object, and a decoder for determining a 3D shape of said object from distortions of said signal in said detected reflections (column 8, lines 51-53, the image generator (fig 1, element 22) combines the distorted patterns for reconstruction of surface contains (fig 1, elements 12, 14 and 22).

As to claim 2, Huang discloses the 3D scanning device of claim 1, wherein said rapidly changing time signal comprises binary pattern elements (scanning device (fig 1) consists of a digital optical retrieval device which is a CCD (note, column 8, lines 45- 46) consisting of binary signals (fig 2, element 31 (intensity profile)also see column 5, lines 4-8) .

As to claim 3, Huang discloses the 3D scanning device of claim 2, wherein said detector comprises a plurality of pixels, and each pixel is configured to output a binary signal indicating said detecting reflections (note, detector in the scanning devices (fig 1 element 20) has a CCD with an array of pixels configured to measure data points, (column 8, lines 45- 46, 47- 50).

As to claim 4, Huang discloses the 3D scanning device of claim 2, wherein said rapidly changing time signal defines a sequence of time frames (column 5, lines 4-8, time from sequence is explained as sequential projection).

As to claim 5, Huang discloses the 3D scanning device of claim 4, wherein said detector comprises a plurality of pixels, and each pixel is configured to output a single bit per time frame indicating said detecting reflections (column 8, lines 41-50) and column 5, lines 4-8, explains the CCD and pixel arrangement for generating data output from each pixel per frame).

As to claim 6, Huang discloses the 3D scanning device of claim 1, further comprising a preprocessor for thresholding and encoding data received at pixels of said detector thereby to recover said binary data (the scanning device consists of a (fig 1, element 10 and 22) signal generator which consists of a processor to perform encoding etc on the data received to generate an image (using recovered binary pixel data).

As to claim 7, Huang discloses a method of real time three-dimensional scanning of an object, comprising:

directing a light beam at said object via a digital micromirror device (fig 3, item 24 a DMD for project light is a part of fig 1, item 18, (column 7, lines 36- 38 and column 7, lines 61-64), fig 4, item 24, 26 and 28);

operating said digital micromirror device to modulate a rapidly changing structural light signal onto said beam (column 8, lines 17- 28) describe the DMD function in a DLP projector);

detecting a reflection of said beam at a detector synchronized with said beam; and decoding said reflection to determine depth information of said object (note, the reflected light from the object is used by the detector (fig 1) item 20), column 8, lines 42-45) .

As to claim 8, Huang discloses the method of claim 7, wherein said rapidly changing structural light signal comprises a binary pattern element (note, the DMD is a binary pattern element (column 7, lines 61-64).

As to claim 9, Huang discloses the method of claim 8, wherein said detector comprises a plurality of sensing pixels, and each pixel sends a binary signal for said decoding (note, the detector consists of a CCD (column 8, lines 47-50) array of pixels sends data for processing by the image generator (fig 1, item 22).

As to claim 10, Huang discloses the method of claim 8, wherein said rapidly changing structural light signal defines time frames, wherein said detector comprises a plurality of sensing pixels and each pixel sends a single bit per time frame for said decoding (note, the detector consists of a CCD (column 8, lines 47-50) array of pixels sends data for processing by the image generator (fig 1, item 22).

As to claim 11, Huang discloses a 3D scanning device comprising:

a beam source for producing a light beam for projection towards an object (a beam source fig 5, item 32 is the illuminator or light source (column 8, line 18);

a digital light binary signal encoding unit connected downstream of said beam source (note, the signal encoding unit (fig 1, item 16 and 22) receives signals from item 20, received from the surface of the object item 12 and 14, column 8, lines 51- 54) , for modulating a rapidly changing structural light signal onto said light beam (note, the detector (column 8, lines 42- 43, 44- 50), sensor the light signals converts to pixel data points front the CCD), said signal comprising a structure selected for distortion by a three-dimensional contour, a detector comprising sensor pixels, synchronized with said digital light binary signal encoding unit, for detecting reflections of said light beam from said object at said sensing pixels as binary data, and a binary decoder for determining a 3D shape of said object from distortions of said time signal in said detected reflections (note, a signal processor (fig 1, item 16 and 22) processes the data (fig 2, flow chart item 23 to the end) to generate the signal for 3D image shape).

As to claim 12, Huang discloses the 3D scanning device of claim 11, further comprising a preprocessor associated with said detector for thresholding and encoding data of said detected reflections at said sensing pixels, thereby to recover said binary data (note, the 3D scanner consisting of a optical retrieval device (fig 1, item 20) retrieves the reflected light data on a sensing device (CCD).

As to claim 13, Huang discloses the 3D scanning device of claim 11, wherein said digital light binary signal encoding unit comprises a digital micromirror device to

modulate said binary data onto said signal (column 8, lines 24- 28, the digital micromirror device is part of the 3D scanning device, fig 5, item 24).

As to claim 14, Huang discloses a method of real time three-dimensional scanning of an object, comprising: directing a light beam at said object (fig 1, item 18 and fig 5, item 32 direct the light as to the object 12 and 14);

modulating a rapidly changing shape signal onto said beam, said signal comprising a shape selected such that distortion thereof is indicative of a three-dimensional contour of said object(column 11, lines 21-31, the shape signal from the object is processed by image generator);

Synchronously detecting a reflection of said beam at a detector synchronized with said modulating of said beam (column 8, lines 37- 39 the optical retrieval device (item 20 of fig 1) detects the reflected light from the object (reflection of distorted image); and

decoding said reflection to extract distortion information of said modulated binary time signal, therefrom to determine information of said three-dimensional contour of said object (column 8, lines 51- 53, states the said function).

As to claim 15, Huang discloses a method of real time three-dimensional scanning of an object, comprising: directing a light beam at said object (fig 1, item 18), modulating a light frame and a dark frame onto said light beam in successive frames prior to reaching said object (column 8, lines 3-8 explains the phenomenon), detecting reflections from said object of said successive frames at a detector to obtain a light frame detection level and a dark frame detection level (the optical retrieval device fig 1

item 20) detects the reflections from the object), calculating a mid level between said light frame detection level and said dark frame detection level (column 10, lines 8-24, explains the calculation for quality of data , setting said mid level as a detection threshold at said detector (note, the average or mid level intensity is calculated by using Fourier coefficients,(column 10, lines 26- 30), modulating a plurality of structural light signals onto said beam in further successive frames (column 10, lines 31-35, explains modulation of signals), detecting said successive frames at said detector using said detection threshold, thereby to provide binary detection of said structured light signal (column 13, lines 65- 67, column 14, lines 1-8, describe the process of detection of successive frames through a synchronization sequence), and determining a three-dimensional structure of said object from detected distortions in said structured light signals (column 14, lines 13- 24, the 3D structure is reconstruction through the fringe pattern generator(fig 1item 16).

As to claim 16, Huang discloses the method of claim 15, wherein said detecting is synchronized with said modulating (fig 1, item 20 is connected to item 16 and 22 which modulate the signals (column 10, lines 21-30).

As to claim 17, Huang discloses the method of claim 15, wherein said modulating is carded out using a digital micromirror device (column 8, lines 3-8, modulation of light and dark frames are carried out using DMD).

Other prior art cited

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Jia et al., (US. 7,545,516 B2) discloses Full-field three- dimensional measurement method.

Contact Information

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is. 571-272-7446. The examiner can normally be reached on Monday - Friday 8.30 am - 5.00 pm and every Wednesday work from home. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on 571-272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sheela C Chawan/

7/19/09

Primary Examiner, Art Unit 2624